

CONTRIBUTIONS  
FROM THE  
CUSHMAN LABORATORY  
FOR  
FORAMINIFERAL RESEARCH

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VOLUME 24, PART 2  
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1948



# CUSHMAN LABORATORY FOR FORAMINIFERAL RESEARCH

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These Contributions will be issued quarterly. They will contain short papers with plates, describing new forms and other interesting notes on the general research work on the foraminifera being done on the group by the workers in this laboratory. New literature as it comes to hand will be briefly reviewed.

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## CONTRIBUTIONS FROM THE CUSHMAN LABORATORY FOR FORAMINIFERAL RESEARCH

### 310. A FORAMINIFERAL FAUNA FROM THE COOK MOUNTAIN FORMATION OF MISSISSIPPI\*

By JOSEPH A. CUSHMAN and RUTH TODD

A foraminiferal fauna of the Lisbon formation from Alabama was recorded in these Contributions (vol. 21, 1945, pp. 11-21, pls. 3, 4). The fauna of the Cook Mountain formation of Mississippi recorded here is similar, but many species are present which were not found in the previous material and many of those found before are lacking in the present material. The two faunas will give a fairly good series of species for the Lisbon formation and its partial equivalent, the Cook Mountain formation and show their connection with beds in other localities from which faunas of Claiborne age have been recorded.

The present material is from beds, previously known as Wautubbee marl, at a locality on Mississippi Highway 15, 0.9 mile north of intersection of U. S. Highway 80 and State Highway 15, Newton County, Miss., and was collected by Dr. Cecil G. Lalicker.

#### Family TEXTULARIIDAE

##### Genus SPIROPECTAMMINA Cushman, 1927

**SPIROPECTAMMINA WILCOXENSIS** Cushman and Ponton (Pl. 5, figs. 1, 2)

(For references, see these Contributions, vol. 20, 1944, p. 29.)

Specimens very similar to the types of this species occur in the present material but show some differences. Previous records are all from the Wilcox and Paleocene.

##### Genus TEXTULARIA DeFrance, 1824

**TEXTULARIA CLAIBORNENSIS** Weinzierl and Applin (Pl. 5, figs. 3, 4)

*Textularia claibornensis* WEINZIERL and APPLIN, Journ. Pal., vol. 3, 1929, p. 392, pl. 44, fig. 1.—DAVIS, l. c., vol. 15, 1941, p. 147, pl. 24, figs. 5, 6.

This species has been known only from the Claiborne, Yegua and the so-called Crockett formations, of Texas. Specimens in our material are rare but fairly typical.

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## Family MILIOLIDAE

Genus *QUINQUELOCULINA* d'Orbigny, 1826*QUINQUELOCULINA YEGUAENSIS* Weinzierl and Applin (Pl. 5, figs. 5, 6)

(For references, see these Contributions, vol. 21, 1945, p. 12.)

This seems to be a typical Claiborne species. It is already recorded from the Claiborne of Texas, Louisiana, and Alabama, and from the Eocene of California. Typical specimens occur in our material.

*QUINQUELOCULINA MAURICENSIS* Howe (Pl. 5, figs. 7, 8)

*Quinqueloculina mauricensis* HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 35, pl. 4, figs. 8-10.—CUSHMAN and APPLIN, Contr. Cushman Lab. Foram. Res., vol. 19, 1943, p. 32, pl. 7, fig. 8.—CUSHMAN and TODD, l. c., vol. 21, 1945, p. 12, pl. 3, figs. 5, 6.

This species seems to be limited to beds of Claiborne age. It was described from the Cook Mountain formation of Louisiana and is recorded from the Yegua formation of Texas and the Lisbon formation of Alabama. Typical specimens are common in our present material.

*QUINQUELOCULINA HERMOSA* Cole (Pl. 5, fig. 9)

*Quinqueloculina hermosa* COLE, Bull. Amer. Pal., vol. 14, No. 51, 1927, p. 13, pl. 2, figs. 27, 28.

Specimens in the present material seem identical with this species described from the Eocene, Guayabal formation, of Mexico.

Genus *MASSILINA* Schlumberger, 1893*MASSILINA* (?) *MAURICENSIS* Howe and Ellis (Pl. 5, fig. 10)

*Massilina mauricensis* HOWE and ELLIS, in HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 36, pl. 3, figs. 14-16.

Rare specimens in our material are referred to this species with some question. Our specimens seem to belong in *Quinqueloculina* rather than *Massilina* and if they are the same a new name will have to be proposed as this specific name has already been used in *Quinqueloculina*. Type material is not available to confirm this.

Genus *TRILOCULINA* d'Orbigny, 1826*TRILOCULINA INUSITATA* Cushman and Garrett (Pl. 5, figs. 11, 12)

*Triloculina inusitata* CUSHMAN and GARRETT, Contr. Cushman Lab. Foram. Res., vol. 10, 1934, p. 66, pl. 9, figs. 8-10.—HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 37, pl. 3, fig. 6.

The only previous records for this species are from the Claiborne, Cook Mountain formation, of Louisiana. Rare but typical specimens occur in our collection from Mississippi.

*TRILOCULINA GARRETTI* Howe (Pl. 5, figs. 13, 14)

*Triloculina garretti* HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 37, pl. 2, figs. 3-5.—CUSHMAN and TODD, Contr. Cushman Lab. Foram. Res., vol. 21, 1945, p. 12, pl. 3, fig. 9.

Rare but typical specimens occur in our material. The species is known from the Claiborne, Cook Mountain formation of Louisiana and Lisbon formation of Alabama.

Family LAGENIDAE

Genus ROBULUS Montfort, 1808

ROBULUS sp. (Pl. 5, fig. 15)

The figured specimen is evidently immature and it is difficult to assign it to a definite species.

Genus PLANULARIA DeFrance, 1824

PLANULARIA WINNIANA Howe and Ellis (Pl. 5, figs. 16, 17)

*Planularia winniana* HOWE and ELLIS, in HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 42, pl. 4, fig. 7.

The only previous record for this species is from the Claiborne, Cook Mountain formation, of Louisiana. Typical specimens occur in our collection from Mississippi.

Genus DENTALINA d'Orbigny, 1826

DENTALINA sp. A (Pl. 5, fig. 18)

The single immature specimen figured cannot be specifically named without more material.

DENTALINA sp. B (Pl. 5, fig. 19)

This specimen also, quite different from the preceding, needs more material to warrant a specific determination.

Genus LAGENA Walker and Jacob, 1798

LAGENA COSTATA (Williamson) (Pl. 5, fig. 20)

Numerous specimens in the present material seem to be included in this widely recorded species.

LAGENA SUBSTRIATA Williamson (Pl. 5, fig. 21)

Rare specimens of a very finely striate form seem to belong in this species.

LAGENA FENESTRISSIMA Howe and Ellis (Pl. 5, fig. 23)

*Lagena fenestrissima* HOWE and ELLIS, in HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 50, pl. 6, fig. 18.

This species was described from the Claiborne, Cook Mountain formation, of Louisiana. Numerous specimens in this collection from Mississippi are identical. The wall is very finely pitted and the neck has several raised rings. The whole appearance suggests the Radiolaria but specimens were tested with acid and are entirely calcareous. The species is an unusual one and should make a good index fossil for the Claiborne.



**LAGENA LISBONENSIS** Cushman and Todd, n. sp. (Pl. 5, fig. 22)

*Lagena costata* (WILLIAMSON), var. *amphora* HOWE (not REUSS), Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 49, pl. 6, fig. 15.

Test elongate, tapering from the greatest width near the base to the thin, elongate neck, wall ornamented with thin and rather high costae, usually six in number extending the whole length of the test, slightly reduced, usually to four near the aperture, and often tending to be somewhat spiral, at the base the costae extend backward forming slight projections, apertural end without a definite lip. Length 0.30-0.55 mm.; diameter 0.15-0.20 mm.

Holotype (Cushman Coll. No. 56817) from the Claiborne Eocene, Cook Mountain formation, Mississippi Highway 15, 0.9 mile north of intersection with U. S. Highway 80, Newton Co., Miss.

This is evidently the form figured by Howe from the Cook Mountain formation of Louisiana in the above reference. That specimen had evidently been broken and the tapering apertural part lost. It differs from Reuss' species in the shape of the chamber and the much fewer costae. The species is common in our material from Mississippi and shows only a small amount of variation.

**LAGENA MISSISSIPPIENSIS** Cushman and Todd, n. sp. (Pl. 5, fig. 24)

Test small, pyriform, greatest width slightly below the middle, base somewhat truncate, apertural end tapering, with a slight cylindrical neck; wall ornamented with 15 to 18 longitudinal costae, rather thick with radiating tubular portions; aperture very small, without a distinct lip. Length 0.20-0.30 mm.; diameter 0.17-0.20 mm.

Holotype (Cushman Coll. No. 56820) from the Claiborne Eocene, Cook Mountain formation, Mississippi Highway 15, 0.9 mile north of intersection with U. S. Highway 80, Newton Co., Miss.

This species somewhat resembles *L. aspera* Reuss but the costae are not spinose. It also is somewhat like *L. striatopunctata* Parker and Jones but differs in the coarseness of the costae and the shape of the test.

**LAGENA** sp. (Pl. 5, fig. 25)

The single specimen figured is difficult to identify until more specimens are available.

## Family POLYMORPHINIDAE

## Genus GUTTULINA d'Orbigny, 1839

**GUTTULINA HANTKENI** Cushman and Ozawa (Pl. 5, fig. 27)

*Polymorphina acuta* HANTKEN (not D'ORBIGNY), Mitth. Jahrb. K. Ungar. geol. Anstalt, vol. 4, 1875 (1881), p. 60, pl. 8, fig. 4 (*acuminata* on explanation of plate).

*Guttulina hantkeni* CUSHMAN and OZAWA, Proc. U. S. Nat. Mus., vol. 77, Art. 6, 1930, p. 33, pl. 5, figs. 4-6.—CUSHMAN and DUSENBURY, Contr. Cushman Lab. Foram. Res., vol. 10, 1934, p. 60, pl. 8, fig. 5.—CUSHMAN and TODD, l. c., vol. 18, 1942, p. 34, pl. 6,

figs. 11, 12.—CURRAN, Bull. Amer. Assoc. Petr. Geol., vol. 27, 1943, p. 1381 (list).—CUSHMAN and TODD, Contr. Cushman Lab. Foram. Res., vol. 22, 1946, p. 56, pl. 10, fig. 2.

The figured specimen seems to belong to this species which is recorded from the Eocene of widely separated areas. It has been recorded from New Jersey and Louisiana in beds of Claiborne age.

**GUTTULINA IRREGULARIS** (d'Orbigny) (Pl. 5, fig. 26)

(For references, see Special Publ. 16, Cushman Lab. Foram. Res., 1946, p. 18.)

Specimens referable to this species are fairly common in this Mississippi material. It is widely recorded from the Tertiary, including records from beds of Claiborne age.

**Genus GLOBULINA** d'Orbigny, 1839

**GLOBULINA GIBBA** d'Orbigny (Pl. 5, fig. 28)

(For earlier references, see these Contributions, vol. 19, 1943, p. 35.)

Specimens of this species are fairly common in the collection from Mississippi.

**Genus GLANDULINA** d'Orbigny, 1826

**GLANDULINA OVATA** (Cushman and Applin) (Pl. 5, fig. 29)

(For references, see these Contributions, vol. 21, 1945, p. 89.)

A few specimens in this material seem to belong to this species. Specimens show the early biserial chambers.

**Genus SIGMOMORPHINA** Cushman and Ozawa, 1928

**SIGMOMORPHINA JACKSONENSIS** (Cushman) (Pl. 5, fig. 30)

(For references, see Special Publ. 16, Cushman Lab. Foram. Res., 1946, p. 19.)

A single specimen in this material seems more like this species than like *S. pseudoregularis* Cushman and Thomas but more specimens may show it to be the latter which is typically a Claiborne species.

**SIGMOMORPHINA SEMITECTA** (Reuss), var. **TERQUEMIANA** (Fornasini) (Pl. 5, fig. 31)

(For references, see Special Publ. 16, Cushman Lab. Foram. Res., 1946, p. 20.)

Specimens of this widely recorded variety are common in the collection from Mississippi.

**Genus POLYMORPHINA** d'Orbigny, 1826

**POLYMORPHINA FISKI** Howe (Pl. 5, fig. 32)

*Polymorphina fiski* HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 56, pl. 7, fig. 2.

The single specimen figured was the only one found in the Mississippi material and seems closely related to this species described from the Cook Mountain formation of Louisiana.



## Family NONIONIDAE

## Genus NONION Montfort, 1808

**NONION PLANATUM** Cushman and Thomas (Pl. 6, fig. 1)

(For references, see Special Publ. 16, Cushman Lab. Foram. Res., 1946, p. 21.)

This species recorded from the Eocene of Claiborne and Jackson ages and from the Oligocene is common in our material.

**NONION FLORINENSE** Cole (Pl. 6, fig. 2)

(For references, see these Contributions, vol. 21, 1945, p. 15.)

Typical specimens of this species occur in our material. It is recorded from the Guayabal formation of Mexico, the Cook Mountain formation of Louisiana, and the Lisbon formation of Alabama.

**NONION MAURICENSIS** Howe and Ellis (Pl. 6, fig. 3)

*Nonion mauricensis* HOWE and ELLIS, in HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 57, pl. 8, figs. 1, 2.—CUSHMAN and TODD, Contr. Cushman Lab. Foram. Res., vol. 21, 1945, p. 15, pl. 3, figs. 27, 28.

Specimens are abundant in our material. The species is known from the Cook Mountain formation of Louisiana and the Lisbon formation of Alabama.

**NONION PREADVENUM** Howe (Pl. 6, fig. 4)

*Nonion preadvenum* HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 58, pl. 8, figs. 3, 4.

This species has been known only from the Cook Mountain formation of Louisiana. Several specimens apparently of this species occur in our material.

**NONION DANVILLENSE** Howe and Wallace (Pl. 6, fig. 5)

(For earlier references, see Special Publ. 16, Cushman Lab. Foram. Res., 1946, p. 21.)

Rare but typical specimens occur in the material from Mississippi.

## Family BULIMINIDAE

## Genus ROBERTINA d'Orbigny, 1846

**ROBERTINA PLUMMERAE** Cushman and Parker (Pl. 6, fig. 6)

*Robertina plummerae* CUSHMAN and PARKER, Contr. Cushman Lab. Foram. Res., vol. 14, 1938, p. 73, pl. 13, fig. 1.—HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 82, pl. 8, figs. 43, 44.—CUSHMAN and PARKER, U. S. Geol. Survey Prof. Paper 210-D, 1947, p. 72, pl. 18, fig. 3.

This species is very rare but typical in our material. It is recorded from beds of Claiborne age in Texas and Louisiana.

## Genus BULIMINA d'Orbigny, 1826

**BULIMINA SIMPLEX** Terquem (Pl. 6, fig. 7)

*Bulimina simplex* TERQUEM, Mem. Soc. geol. France, ser. 3, vol. 2, 1882, p. 109, pl. 11 (9), figs. 23, 24?—CUSHMAN and PARKER, Contr. Cushman Lab. Foram. Res., vol. 13, 1937, p. 67, pl. 9, fig. 4.—CUSHMAN and TODD, l. c., vol. 21, 1945, p. 17, pl. 4, fig. 5.—CUSHMAN and PARKER, U. S. Geol. Survey Prof. Paper 210-D, 1947, p. 89, pl. 21, fig. 9.



The specimen figured from the collection from Mississippi seems to belong to this species already recorded from the Lisbon formation of Alabama.

Genus **VIRGULINA** d'Orbigny, 1826

**VIRGULINA DIBOLLENSIS** Cushman and Applin, var. (Pl. 6, fig. 8)

Rare specimens similar to the one figured occur in this present material. They probably represent a distinct variety but more specimens are needed to give the full characters.

Genus **BOLIVINA** d'Orbigny, 1839

**BOLIVINA TAYLORI** Howe (Pl. 6, fig. 10)

*Bolivina taylori* HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 67, pl. 9, figs. 9, 10.—CUSHMAN and APPLIN, Contr. Cushman Lab. Foram. Res., vol. 19, 1943, p. 39, pl. 7, fig. 27.

This species is very rare in our material. The other records are from the Cook Mountain formation of Louisiana and the Yegua formation of Texas.

**BOLIVINA MAURICENSIS** Howe (Pl. 6, fig. 9)

*Bolivina mauricensis* HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 66, pl. 9, figs. 5, 6.

A single specimen from the present material seems to be identical with this species described from the Cook Mountain formation of Louisiana.

Genus **ANGULOGERINA** Cushman, 1927

**ANGULOGERINA MAURICENSIS** Howe (Pl. 6, fig. 11)

*Angulogerina mauricensis* HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 71, pl. 8, figs. 27, 28.

Rare specimens in our material seem identical with this species described from the Cook Mountain formation of Louisiana.

Genus **ENTOSOLENIA** Ehrenberg, 1848

**ENTOSOLENIA MAURICENSIS** (Howe and Roberts) (Pl. 6, fig. 12)

*Ellipsolagena* (?) *mauricensis* HOWE and ROBERTS, in HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 72, pl. 9, figs. 12, 13.

Numerous specimens in our material seem identical with this species described from the Cook Mountain formation of Louisiana.

**ENTOSOLENIA** cf. **MARGINATA** (Montagu)

Very rare specimens may be referred questionably to this species until more material is available.

**ENTOSOLENIA MARGINATA** (Montagu), var. **LISBONENSIS** Cushman and Todd, n. var.

(Pl. 6, fig. 13)

Variety differing from the typical form in the ornamentation of the surface consisting of numerous very fine longitudinal costae somewhat divided transversely.

Holotype of variety (Cushman Coll. No. 56854) from the Claiborne Eocene, Cook Mountain formation, Mississippi Highway 15, 0.9 mile north of intersection with U. S. Highway 80, Newton Co., Miss.

The variety is fairly common in our material. The peculiar surface ornamentation seeming almost like finely dotted lines should easily identify it.

### Family ROTALIIDAE

#### Genus *SPIRILLINA* Ehrenberg, 1843

*SPIRILLINA SELSEYENSIS* Heron-Allen and Earland (Pl. 6, figs. 14, 15)

*Spirillina selseyensis* HERON-ALLEN and EARLAND, Journ. Roy. Micr. Soc., 1909, p. 440, pl. 18, figs. 6, 7.—CUSHMAN and GARRETT, Contr. Cushman Lab. Foram. Res., vol. 15, 1939, p. 84, pl. 14, figs. 28, 29.—CUSHMAN and TODD, l. c., vol. 18, 1942, p. 38, pl. 7, fig. 2.—CUSHMAN, l. c., vol. 20, 1944, p. 45, pl. 7, fig. 20.

Specimens from the material from Mississippi are very much like this species described from the Eocene of England and recorded in America from beds of Paleocene and Wilcox age.

#### Genus *DISCORBIS* Lamarck, 1804

*DISCORBIS HEMISPHERICA* Cushman (Pl. 6, figs. 16, 17)

(For references, see these Contributions, vol. 21, 1945, p. 100.)

Most of the records for this species are from beds of Jackson age, but it is recorded from the Claiborne, Cook Mountain formation, of Louisiana. Typical specimens are common in this material.

*DISCORBIS MAURICENSIS* Howe and Roberts (Pl. 6, fig. 18)

*Discorbis mauricensis* HOWE and ROBERTS, in HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 74, pl. 9, figs. 28-30.

The figured specimen from the present material seems identical with this species described from the Cook Mountain formation of Louisiana.

#### Genus *GYROIDINA* d'Orbigny, 1826

*GYROIDINA SOLDANII* d'Orbigny, var. *OCTOCAMERATA* Cushman and G. D. Hanna

(Pl. 6, figs. 20, 21)

(For earlier references, see Special Publ. 16, Cushman Lab. Foram. Res., 1946, p. 31.)

—CUSHMAN and STONE, Special Publ. 20, 1947, p. 22, pl. 3, fig. 6.

### EXPLANATION OF PLATE 5

FIGS. 1, 2. *Spiroplectammina wilcoxensis* Cushman and Ponton. 3, 4. *Textularia clai-bornensis* Weinzierl and Applin.  $\times 45$ . 5, 6. *Quinqueloculina yeguaensis* Weinzierl and Applin. 7, 8. *Q. mauricensis* Howe. 9. *Q. hermosa* Cole. 10. *Massilina* (?) *mauricensis* Howe and Ellis. 11, 12. *Triloculina inusitata* Cushman and Garrett. 13, 14. *T. garretti* Howe. 15. *Robulus* sp. 16, 17. *Planularia winniana* Howe and Ellis. 18. *Dentalina* sp. A. 19. *Dentalina* sp. B. 20. *Lagena costata* (Williamson). 21. *L. substriata* Williamson. 22. *L. lisbonensis* Cushman and Todd, n. sp. Holotype. 23. *L. fenestrisima* Howe and Ellis. 24. *L. mississippiensis* Cushman and Todd, n. sp. Holotype. 25. *Lagena* sp. 26. *Guttulina irregularis* (d'Orbigny).  $\times 45$ . 27. *G. hantkeni* Cushman and Ozawa.  $\times 45$ . 28. *Globulina gibba* d'Orbigny.  $\times 45$ . 29. *Glandulina ovata* (Cushman and Applin). 30. *Sigmomorphina jacksonensis* (Cushman).  $\times 45$ . 31. *S. semitecta* (Reuss), var. *terquemiana* (Fornasini). 32. *Polymorphina fiski* Howe.  $\times 45$ .

Unless otherwise noted, all figures  $\times 70$ .









There are numerous specimens showing considerable variation in the material from Mississippi.

**Genus CANCRIS Montfort, 1808**

**CANCNIS CLAIBORNENSIS Howe (Pl. 6, fig. 19)**

*Cancris claibornensis* HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 78, pl. 10, figs. 20, 21.—CUSHMAN and TODD, Contr. Cushman Lab. Foram. Res., vol. 18, 1942, p. 86, pl. 22, figs. 5-7; l. c., vol. 21, 1945, p. 19.

Typical specimens of this Claiborne species occur in our material. It is known from the Cook Mountain formation of Louisiana and the Lisbon formation of Alabama.

**Genus SIPHONINA Reuss, 1850**

**SIPHONINA CLAIBORNENSIS Cushman (Pl. 6, figs. 22, 23)**

*Siphonina claibornensis* CUSHMAN, Proc. U. S. Nat. Mus., vol. 72, Art. 20, 1927, p. 4, pl. 3, fig. 5.—CUSHMAN and THOMAS, Journ. Pal., vol. 3, 1929, p. 181, pl. 24, fig. 2.—CUSHMAN and DUSENBURY, Contr. Cushman Lab. Foram. Res., vol. 10, 1934, p. 62. HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 76, pl. 10, figs. 4-6, 10, 11.—CUSHMAN and APPLIN, Contr. Cushman Lab. Foram. Res., vol. 19, 1943, p. 42, pl. 8, fig. 7.—CUSHMAN and TODD, l. c., vol. 21, 1945, p. 19.

Numerous typical specimens of this Claiborne species occur in our material. It is recorded from the Yegua formation of Texas, the Lisbon formation of Alabama, and the Eocene of California.

**Family CASSIDULINIDAE**

**Genus ALABAMINA Toulmin, 1941**

**ALABAMINA WILCOXENSIS Toulmin (Pl. 6, figs. 28, 29)**

*Alabamina wilcoxensis* TOULMIN, Journ. Pal., vol. 15, 1941, p. 603, pl. 81, figs. 10-14, text figs. 4A-C.

**EXPLANATION OF PLATE 6**

FIG. 1. *Nonion planatum* Cushman and Thomas. 2. *N. florinense* Cole. 3. *N. mauricensis* Howe and Ellis. 4. *N. preadvenum* Howe. 5. *N. danvillense* Howe and Wallace. 6. *Robertina plummerae* Cushman and Parker. 7. *Bulimina simplex* Terquem. 8. *Virgulina dibollensis* Cushman and Applin, var. 9. *Bolivina mauricensis* Howe. 10. *B. taylori* Howe. 11. *Angulogerina mauricensis* Howe. 12. *Entosolenia mauricensis* (Howe and Roberts). 13. *E. marginata* (Montagu), var. *lisbonensis* Cushman and Todd, n. var. Holotype. 14, 15. *Spirillina selseyensis* Heron-Allen and Earland. 14, Ventral view. 15, Dorsal view. 16, 17. *Discorbis hemisphaerica* Cushman. 16, Ventral view. 17, Dorsal view. 18. *D. mauricensis* Howe and Roberts. 19. *Cancris claibornensis* Howe. 20, 21. *Gyroidina soldanii* d'Orbigny, var. *octocamerata* Cushman and G. D. Hanna. 20, Dorsal view. 21, Ventral view. 22, 23. *Siphonina claibornensis* Cushman. 22, Ventral view. 23, Dorsal view. 24, 25. *Globorotalia wilcoxensis* Cushman and Ponton. 24, Dorsal view. 25, Ventral view. 26, 27. *G. inconspicua* Howe. 26, Dorsal view. 27, Ventral view. 28, 29. *Alabamina wilcoxensis* Toulmin. 28, Dorsal view. 29, Ventral view. 30, 31. *Cibicides mauricensis* Howe and Roberts. 30, Dorsal view. 31, Ventral view. 32, 33. *C. westi* Howe. 32, Ventral view. 33, Peripheral view. 34. *C. sassei* Cole. 35-37. *C. lalickeri* Cushman and Todd, n. sp. 35, Holotype, ventral view. 36, 37, Paratypes. 36, Dorsal view of elongate specimen. 37, Ventral view.

All figures  $\times 70$ .

Specimens seemingly identical with this species occur in this material. The synonymy of this species is difficult to straighten out and is not attempted here.

### Family GLOBOROTALIIDAE

#### Genus GLOBOROTALIA Cushman, 1927

**GLOBOROTALIA WILCOXENSIS** Cushman and Ponton (Pl. 6, figs. 24, 25)

(For references, see these Contributions, vol. 20, 1944, p. 27.)

Numerous specimens in the collection from Mississippi seem to be identical with this Wilcox species.

**GLOBOROTALIA INCONSPICUA** Howe (Pl. 6, figs. 26, 27)

*Globorotalia inconspicua* HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 85, pl. 12, figs. 20-22.

Numerous specimens in our material seem identical with this minute species described from the Cook Mountain formation of Louisiana.

### Family ANOMALINIDAE

#### Genus CIBICIDES Montfort, 1808

**CIBICIDES MAURICENSIS** Howe and Roberts (Pl. 6, figs. 30, 31)

*Cibicides mauricensis* HOWE and ROBERTS, in HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 87, pl. 13, figs. 4, 5.—CUSHMAN and TODD, Contr. Cushman Lab. Foram. Res., vol. 21, 1945, pp. 20, 103.

Abundant specimens of this species occur in our material. It was described from the Cook Mountain formation and recorded from the Lisbon formation of Alabama and the Moodys Branch marl of Mississippi.

**CIBICIDES WESTI** Howe (Pl. 6, figs. 32, 33)

*Cibicides westi* HOWE, Geol. Bull. 14, Louisiana Geol. Survey, 1939, p. 88, pl. 13, figs. 20-22.—KELLEY, Bull. Amer. Assoc. Petr. Geol., vol. 27, 1943, p. 11 (list).—CUSHMAN and HERRICK, Contr. Cushman Lab. Foram. Res., vol. 21, 1945, p. 72, pl. 11, fig. 15.

This species was described from the Cook Mountain formation of Louisiana. It is recorded from the Eocene of California and the Claiborne, McBean formation, of Georgia. Specimens are common in the material from Mississippi and show a considerable amount of variation especially in the thickness of the ventral side.

**CIBICIDES SASSEI** Cole (Pl. 6, fig. 34)

(For earlier references, see these Contributions, vol. 19, 1943, p. 46, pl. 8, fig. 12.)—CUSHMAN and TODD, Contr. Cushman Lab. Foram. Res., vol. 21, 1945, p. 20.

The figured specimen is placed under this species which was described from the Guayabal formation of Mexico and recorded from the Yegua formation of Texas, the Cook Mountain formation of Louisiana, the Lisbon formation of Alabama, and the Eocene of California.



**CIBICIDES LALICKERI** Cushman and Todd, n. sp. (Pl. 6, figs. 35-37)

Test plano-convex, dorsal side flattened or slightly concave, ventral side convex, becoming more strongly so in the last few chambers, periphery subacute; chambers distinct, usually 8 in the final whorl, very slightly inflated, increasing rather evenly in size as added; sutures distinct, strongly limbate, strongly curved, little if at all depressed; wall smooth, distinctly perforate; aperture on the dorsal side at the base of the inner margin of the last-formed chamber, occasionally with a slight lip. Length 0.25-0.33 mm.; breadth 0.25-0.28 mm.; thickness 0.10-0.17 mm.

Holotype (Cushman Coll. No. 56878) from the Claiborne Eocene, Cook Mountain formation, Mississippi Highway 15, 0.9 mile north of intersection with U. S. Highway 80, Newton Co., Miss.

This species is abundant in the collection from Mississippi. It differs from *C. americanus* (Cushman), var. *antiquus* (Cushman and Applin) in the more strongly plano-convex test, smaller size, and usually more elongate form.

### 311. ADDITIONAL NEW SPECIES OF ARENACEOUS FORAMINIFERA FROM SHALLOW WATERS OF TRINIDAD

By J. A. CUSHMAN and P. BRONNIMANN

The following species from the coastal area of Trinidad seem to be undescribed. Some of them resemble figures of described species but when compared with types or topotypes are seen to be very different. These new species are represented by large series of specimens which give the variation characters and make possible a better understanding of the species than a few specimens would give. A later paper will take up the entire fauna and describe the ecological conditions in this area.

#### Family SACCAMMINIDAE

Genus **LEPTODERMELLA** Rhumbler, 1935

**LEPTODERMELLA EXCENTRICA** Cushman and Bronnimann, n. sp. (Pl. 7, figs. 1, 2)

Test consisting of a single chamber, distinctly concave at the base, nearly hemispherical dorsally; wall rather coarsely arenaceous, thin, the surface smooth; aperture an elongate opening at one side of the depressed ventral side. Height 0.15-0.18 mm.; diameter 0.25-0.30 mm.

Holotype (Cushman Coll. No. 56752) from 0-2 fathoms, Gulf of Paria, Trinidad, B. W. I.

This species differs from *L. arenata* (Cushman) in the more coarsely

arenaceous test and the elongate aperture at one side of the depressed ventral face.

### Family LITUOLIDAE

#### Genus AMMOBACULITES Cushman, 1910

**AMMOBACULITES DIRECTUS** Cushman and Bronnimann, n. sp. (Pl. 7, figs. 3, 4)

Test small, strongly compressed, early portion close coiled, later uncoiled portion with nearly parallel sides, very slightly if at all broader than the early coiled portion, apertural end rounded; chambers rather indistinct, usually about four in the uncoiled portion; sutures indistinct, slightly if at all depressed, somewhat oblique in the uncoiled portion; wall very thin, rather coarsely arenaceous for the size of the test, the exterior fairly smooth; aperture narrowly elliptical, terminal, without a neck. Length 0.35-0.40 mm.; breadth 0.12-0.14 mm.

Holotype (Cushman Coll. No. 56755) from 0-2 fathoms, Gulf of Paria, Trinidad, B. W. I.

This species is common in this material and shows little variation. It differs from *A. foliaceus* (H. B. Brady) in its much smaller size, fewer chambers, and less distinct sutures.

**AMMOBACULITES DIVERSUS** Cushman and Bronnimann, n. sp. (Pl. 7, figs. 5, 6)

Test small, somewhat compressed, early portion close-coiled and extending out distinctly from the later uncoiled portion which has nearly parallel sides; chambers of the uniserial portion distinct and slightly inflated, increasing very slightly in height as added, the last-formed chamber slightly contracted at the outer end to form a very slight neck; sutures of the early coiled portion indistinct, later ones in the uncoiled portion slightly depressed and curved upward; wall rather coarsely arenaceous but fairly smoothly finished; aperture elongate, elliptical. Length 0.32-0.40 mm.; breadth 0.12-0.15 mm.

Holotype (Cushman Coll. No. 56758) from 0-2 fathoms, Gulf of Paria, Trinidad, B. W. I.

This is also a common species in this area and differs from *A. directus* Cushman and Bronnimann, n. sp., in the more distinct sutures, larger number of chambers, slight contraction of the apertural end, and the coiled early portion extending out strongly beyond the lines of the uncoiled portion.

**AMMOBACULITES EXIGUUS** Cushman and Bronnimann, n. sp. (Pl. 7, figs. 7, 8)

Test small, not compressed, early coiled portion much broader than the later uncoiled portion, the latter with nearly parallel sides, apertural end truncate; chambers rather indistinct, the later uncoiled ones often very slightly inflated; sutures mostly indistinct; wall very coarsely arena-



ceous for the size of the test but rather smoothly finished; aperture small, nearly circular, terminal. Length 0.30-0.45 mm.; breadth of coiled portion 0.13-0.20 mm.; breadth of uncoiled portion 0.10-0.12 mm.

Holotype (Cushman Coll. No. 56761) from 0-2 fathoms, Gulf of Paria, Trinidad, B. W. I.

This species superficially resembles *A. agglutinans* (d'Orbigny) but is very different when compared with topotypes of d'Orbigny's species. Our species is very much smaller, has a larger number of chambers, very much less distinct sutures, and a much smoother surface.

**AMMOBACULITES EXILIS** Cushman and Bronnimann, n. sp. (Pl. 7, fig. 9)

Test of medium size, compressed except the last-formed one or two chambers which tend to become inflated, early coiled portion slightly wider than the earlier uncoiled chambers but of about the same width as the last-formed ones, apertural end distinctly contracted to form a slight neck; chambers fairly distinct, little if at all inflated except in the last portion; sutures mostly indistinct; wall very coarsely arenaceous, somewhat rough; aperture terminal, elliptical. Length 0.75-1.10 mm.; breadth 0.27-0.35 mm.

Holotype (Cushman Coll. No. 56767) from 0-2 fathoms, Gulf of Paria, Trinidad, B. W. I.

This species differs from *A. agglutinans* (d'Orbigny) in the compressed test, larger number of chambers, and contracted apertural end.

**AMMOBACULITES DILATATUS** Cushman and Bronnimann, n. sp. (Pl. 7, figs. 10, 11)

Test of medium size, much compressed throughout, early portion close-coiled, slightly umbilicate, later two or three chambers uncoiled, apertural end truncate but somewhat contracted; chambers rather indistinct, not inflated; sutures indistinct, not depressed; wall arenaceous, of medium coarseness, surface fairly smooth; aperture terminal, narrow. Length 0.50-0.65 mm.; breadth 0.40-0.45 mm.

Holotype (Cushman Coll. No. 56769) from 0-2 fathoms, Gulf of Paria, Trinidad, B. W. I.

This species differs from *A. bargmanni* Earland in the less curved sutures, much coarser wall, and more rounded periphery.

**AMMOBACULITES PSEUDOCASSIS** Cushman and Bronnimann, n. sp. (Pl. 7, fig. 12)

Test elongate, curved, strongly compressed, especially in the early portion, periphery rounded; early portion coiled, later uncoiling, apertural end slightly contracted; chambers fairly distinct, the last-formed ones tending to be somewhat more inflated, increasing rather rapidly in size as added; sutures fairly distinct, strongly oblique, slightly depressed; wall

rather finely but distinctly arenaceous, surface fairly smooth; aperture terminal, rounded. Length 0.45-0.55 mm.; breadth 0.15-0.23 mm.

Holotype (Cushman Coll. No. 56764) from inshore mud, brackish water, Mangrove swamp, west coast of Trinidad, B. W. I.

This species resembles some of the figures referred to *A. cassis* (Parker) but differs from the type in the more slender, curved test and very much more oblique sutures and in not increasing in diameter in the later portion.

**AMMOBACULITES SALSUS** Cushman and Bronnimann,

var. **DISTINCTUS** Cushman and Bronnimann, n. var. (Pl. 7, figs. 13, 14)

Variety differing from the typical form in the more slender shape and more compressed and slightly umbilicate coiled portion.

Holotype of variety (Cushman Coll. No. 56771) from 0-2 fathoms, Gulf of Paria, Trinidad, B. W. I.

With a large series of specimens this variety seems to be distinct from the typical form.

Family VERNEUILINIDAE

Genus GAUDRYINA d'Orbigny, 1839

**GAUDRYINA EXILIS** Cushman and Bronnimann, n. sp. (Pl. 7, figs. 15, 16)

Test rather small, slender, tapering from the acute initial end to the greatest width at the last pair of chambers, earliest chambers triserial, soon becoming biserial, periphery rounded; chambers fairly distinct, later ones somewhat inflated, increasing gradually and rather evenly in size as added; sutures fairly distinct in the biserial portion, slightly depressed; wall very thin and delicate, very finely arenaceous, with a small amount of cement; aperture a low, elongate opening at the base of the inner margin of the last-formed chamber. Length 0.35-0.55 mm.; breadth 0.15-0.20 mm.

Holotype (Cushman Coll. No. 56774) from 0-2 fathoms, Gulf of Paria, Trinidad, B. W. I.

This species differs from *G. minuta* Earland in the larger size, much shorter triserial stage, and shorter chambers. It is fairly common in this material and shows little variation.

Genus PSEUDOCLAVULINA Cushman, 1936

**PSEUDOCLAVULINA GRACILIS** Cushman and Bronnimann, n. sp. (Pl. 7, figs. 17, 18)

Test very small, elongate, slender, sides nearly parallel throughout in the uniserial portion, initial end quickly tapering, triserial, rounded in transverse section, apertural end truncate; chambers indistinct except in the last portion of the uniserial stage; sutures indistinct; wall rather coarsely arenaceous for the size of the test; aperture terminal, rounded, without a neck. Length 0.45-0.55 mm.; diameter 0.10-0.13 mm.

Holotype (Cushman Coll. No. 56777) from 0-2 fathoms, Gulf of Paria, Trinidad, B. W. I.



This very small, slender species differs from *P. juncea* Cushman in its very much smaller size, fewer chambers, and lack of an apertural neck.

**PSEUDOCALVULINA CURTA** Cushman and Bronnimann, n. sp. (Pl. 7, figs. 19, 20)

Test very small, short, sides nearly parallel, initial end slightly tapering, rounded or bluntly pointed, rounded in transverse section, apertural end broadly rounded; chambers and sutures rather indistinct; wall rather coarsely arenaceous, slightly roughened; aperture terminal, rounded, without a neck. Length 0.35-0.40 mm.; diameter 0.10-0.15 mm.

Holotype (Cushman Coll. No. 56780) from 0-2 fathoms, Gulf of Paria, Trinidad, B. W. I.

This species differs from *P. gracilis* Cushman and Bronnimann, n. sp., in the relatively much shorter and broader test, bluntly rounded initial end, and fewer uniserial chambers. With a large series of both species the difference in the two is very striking.

### Family TROCHAMMINIDAE

Genus **TROCHAMMINA** Parker and Jones, 1860

**TROCHAMMINA COMPRIMATA** Cushman and Bronnimann, n. sp. (Pl. 8, figs. 1-3)

Test trochoid, very much compressed, ventral side concave, dorsal side very slightly convex, periphery rounded; early portion regularly trochoid, later chambers becoming irregular; chambers in the early portion with 4 or 5 chambers in a whorl, increasing rather uniformly in size as added, later becoming irregular and elongate; sutures slightly if at all depressed dorsally, ventrally distinctly depressed and regularly curved in the early stages; wall finely arenaceous, smoothly finished; aperture elongate, ventral. Diameter up to 0.75 mm.

Holotype (Cushman Coll. No. 56787) from inshore mud, brackish water, Mangrove swamp, west coast of Trinidad, B. W. I.

This species differs from *T. pacifica* Cushman in the thinner test, more irregular later portion, and the more curved sutures in the early portion.

**TROCHAMMINA LAEVIGATA** Cushman and Bronnimann, n. sp. (Pl. 7, figs. 21, 22)

*Trochammina globigeriniformis* CUSHMAN and PARKER (not PARKER and JONES), Proc. U. S. Nat. Mus., vol. 80, Art. 3, 1931, p. 6, pl. 2, fig. 4.

Test trochoid, dorsal side slightly convex, ventral side slightly concave, umbilicate, periphery broadly rounded; chambers distinct, slightly inflated dorsally, strongly so ventrally, 5 or 6 in the adult whorl, increasing gradually in size as added; sutures distinct, depressed slightly on the dorsal side, strongly so on the ventral side; wall finely arenaceous with much cement, smoothly finished; aperture a low opening along the umbilical margin of the ventral side of the last-formed chamber. Diameter up to 0.80 mm.; thickness 0.30-0.40 mm.

Holotype (Cushman Coll. No. 56783) from inshore mud, brackish water, Mangrove swamp, west coast of Trinidad, B. W. I.

This species differs from *T. globigeriniformis* (Parker and Jones) in the larger number of chambers in the whorl, less convex dorsal side, and less globular shape of the chambers. It seems identical with specimens in the above reference from off the coast of South America.

### 312. *GLOBIGERINELLOIDES*, A NEW GENUS OF THE GLOBIGERINIDAE

By J. A. CUSHMAN and A. TEN DAM

In the greenish-blue marls of the Upper Cretaceous from the Djebel Menaouer in Western Algeria the junior author found numerous specimens of a peculiar species of foraminifera apparently closely related to *Globigerinella* but differing in several characters from that genus. The following genus is erected with this new species as the genoholotype.

Genus *GLOBIGERINELLOIDES* Cushman and ten Dam, new genus

Genoholotype, *Globigerinelloides algeriana* Cushman and ten Dam, n. sp.

Test planispiral, in the early stages similar to *Globigerinella*, in the adult becoming somewhat loosely coiled, the earlier coils all visible in side view; chambers globular in the earlier stages, in the adult with lateral prolongations reaching to and slightly over the preceding coil; wall calcareous, perforate; aperture at the base of the last-formed chamber in the median line.—Upper Cretaceous.

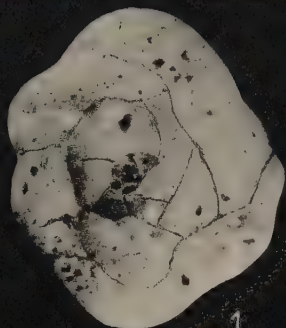
#### EXPLANATION OF PLATE 7

FIGS. 1, 2. *Leptodermella excentrica* Cushman and Bronnimann, n. sp. 1, Holotype, ventral view. 2, Paratype, dorsal view. 3, 4. *Ammobaculites directus* Cushman and Bronnimann, n. sp. 3, Holotype, *a*, front view; *b*, apertural view. 4, Paratype. 5, 6. *A. diversus* Cushman and Bronnimann, n. sp. 5, Holotype, *a*, front view; *b*, apertural view. 6, Paratype. 7, 8. *A. exiguus* Cushman and Bronnimann, n. sp. 7, Holotype, *a*, front view; *b*, apertural view. 8, Paratype. 9. *A. exilis* Cushman and Bronnimann, n. sp. Holotype, *a*, front view; *b*, apertural view. 10, 11. *A. dilatatus* Cushman and Bronnimann, n. sp. 10, Holotype, *a*, front view; *b*, apertural view. 11, Paratype. 12. *A. pseudocassis* Cushman and Bronnimann, n. sp. Holotype, *a*, front view; *b*, apertural view. 13, 14. *A. salsus* Cushman and Bronnimann, var. *distinctus* Cushman and Bronnimann, n. var. 13, Holotype, *a*, front view; *b*, apertural view. 14, Paratype. 15, 16. *Gaudryina exilis* Cushman and Bronnimann, n. sp. 15, Holotype, *a*, front view; *b*, apertural view. 16, Paratype. 17, 18. *Pseudoclavulina gracilis* Cushman and Bronnimann, n. sp. 17, Holotype, *a*, front view; *b*, apertural view. 18, Paratype. 19, 20. *P. curta* Cushman and Bronnimann, n. sp. 19, Holotype, *a*, front view; *b*, apertural view. 20, Paratype. 21, 22. *Trochammina laevigata* Cushman and Bronnimann, n. sp. 21, Holotype, dorsal view. 22, Paratype, ventral view.

All figures  $\times 58$ .







1



2



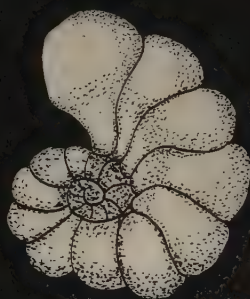
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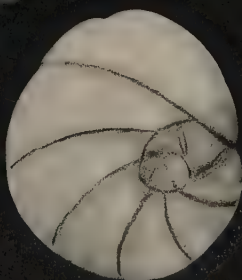
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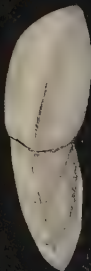
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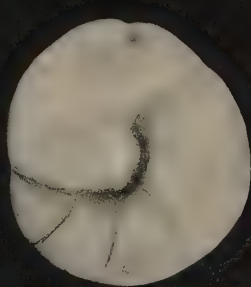
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8a



8c



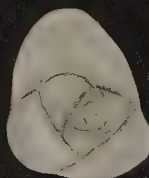
8b



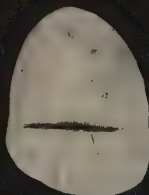
9b



9a



10a



10b



This genus is apparently derived from *Globigerinella* and differs mainly in the greater amount of uncoiling, and the development of the lateral, radial prolongations of the chambers in the adult coil.

The type species is from the Upper Cretaceous of Western Algeria and there are somewhat similar forms developed in the American Upper Cretaceous.

**GLOBIGERINELLOIDES ALGERIANA** Cushman and ten Dam, n. sp. (Pl. 8, figs. 4-6)

Test planispirally coiled, the sides concave, periphery broadly rounded, in the adult stage becoming somewhat loosely coiled; chambers distinct, globular, 10 to 12 in the last-formed coil, increasing very gradually and evenly in size as added, in the last-formed portion with somewhat triangular projections at each side coming to a point above the middle of the preceding coil; sutures distinct, depressed, in the earlier stages nearly radial, later somewhat sigmoid; wall calcareous, finely perforate, the surface somewhat rugose; aperture a small, arched opening in the median line at the base of the apertural face. Diameter 0.55-0.70 mm.; thickness 0.15-0.18 mm.

Holotype (ten Dam Coll. No. A 835) from the Upper Cretaceous, greenish-blue marls from the Djebel Menaouer between Relizane and Uzes-le-Duc, Western Algeria. Paratypes: Cushman Coll. No. 56790.

The species is rather common at the type locality.

### 313. ADDITIONAL NEW FORAMINIFERA FROM THE AMERICAN PALEOCENE

BY JOSEPH A. CUSHMAN

The following three species and one variety appear to be new:

**PALMULA PRIMITIVA** Cushman, var. **PALEOCENICA** Cushman, n. var. (Pl. 8, fig. 7)

*Palmula* cf. *primitiva* CUSHMAN, Contr. Cushman Lab. Foram. Res., vol. 16, 1940, p. 62, pl. 9, fig. 33.—KLINE, Bull. 53, Mississippi State Geol. Survey, 1943, p. 35, pl. 3, fig. 10.

Variety differing from the typical form in the shorter, broader shape and the thicker wall.

#### EXPLANATION OF PLATE 8

FIGS. 1-3. *Trochammina comprimata* Cushman and Bronnimann, n. sp.  $\times 58$ . 1, Holotype, dorsal view. 2, 3, Paratypes, ventral views. 4-6. *Globigerinelloides algeriana* Cushman and ten Dam, n. gen., n. sp. Approximately  $\times 55$ . 6, Holotype. 7, 8, Paratypes. 7. *Palmula primitiva* Cushman, var. *paleocenica* Cushman, n. var. Holotype.  $\times 40$ . 8. *Lamarckina paleocenica* Cushman, n. sp.  $\times 100$ . Holotype. a, dorsal view; b, ventral view; c, peripheral view. 9. *Eponides plummerae* Cushman, n. sp. Holotype. a, dorsal view,  $\times 55$ ; b, ventral view,  $\times 62$ . 10. *Allomorphina paleocenica* Cushman, n. sp.  $\times 70$ . Holotype, a, dorsal view; b, ventral view.

Holotype of variety (Cushman Coll. No. 35698) from the Paleocene, *Ostrea pulaskensis* bed, old abandoned roadway south of Sucarnoochee Creek, about  $\frac{1}{10}$  mile upstream from crossing of U. S. Highway 80,  $\frac{1}{2}$  mile southwest of Livingston, Sumter Co., Ala.

This is probably the same as the form figured by Kline from the Paleocene of Mississippi where it is recorded from the Porters Creek clay and the Clayton formation.

**LAMARCKINA PALEOCENICA** Cushman, n. sp. (Pl. 8, fig. 8)

Test small, dorsal side moderately convex, ventral side flattened or slightly concave, slightly umbilicate, periphery subacute; chambers distinct on the dorsal side, rather indistinct on the ventral side, six or seven in the adult whorl, increasing rapidly in size as added; sutures distinct on the dorsal side, slightly thickened and somewhat raised in the earlier portion, the last one or two often depressed, rather indistinct on the ventral side; wall smooth except for the raised sutures of the dorsal side; aperture ventral, beneath an extended lobe of the last-formed chamber. Length 0.32-0.37 mm.; breadth 0.27-0.30 mm.; thickness 0.15-0.18 mm.

Holotype (Cushman Coll. No. 56881) from the Paleocene, Clayton formation, cut on Southern Railway, 200 feet east of mile post 481,  $1\frac{1}{2}$  miles east of Middleton, Hardeman Co., Tenn.

The species is common at the type locality. It differs from *L. ripleyensis* Cushman in the more compressed and smaller test, fewer chambers, and less raised sutures.

**EPONIDES PLUMMERAE** Cushman, n. sp. (Pl. 8, fig. 9)

*Truncatulina tenera* PLUMMER (not H. B. BRADY), Univ. Texas Bull. 2644, 1926 (1927), p. 146, pl. 9, fig. 5.

*Eponides* cf. *tenera* KLINE, Bull. 53, Mississippi State Geol. Survey, 1943, p. 53, pl. 5, figs. 16-18.

*Eponides* cf. *haidingerii* CUSHMAN and TODD (not D'ORBIGNY), Contr. Cushman Lab. Foram. Res., vol. 22, 1946, p. 62, pl. 11, figs. 5, 6.

*Eponides* sp. CUSHMAN, l. c., vol. 16, 1940, p. 71, pl. 12, fig. 8.

Test small, biconvex, periphery subacute; chambers distinct but not inflated, usually six in the adult whorl, increasing very uniformly in size as added; sutures distinct but not depressed except very slightly on the ventral side, on the dorsal side somewhat oblique, on the ventral side nearly radial, very slightly curved; wall smooth, polished; aperture elongate, narrow, on the ventral side of the last-formed chamber running from just below the periphery almost to the umbilical area, often with a very slight overhanging lip. Diameter 0.32-0.37 mm.; thickness 0.22-0.25 mm.

Holotype (Cushman Coll. No. 56883) from the Paleocene, exposure in creek bed on northeast-southwest country road, 60° E. of Honest Ridge



School, southeast of Nigger Creek Oil Field, Tex. Collected by Helen J. Plummer.

This species differs from *E. tenera* (H. B. Brady) in its more convex dorsal side and more oblique sutures on the dorsal side.

**ALLOMORPHINA PALEOCENICA** Cushman, n. sp. (Pl. 8, fig. 10)

*Allomorphina trigona* PLUMMER (not REUSS), Univ. Texas Bull. 2644, 1926 (1927), p. 129, pl. 8, fig. 5.—KLINE, Bull. 53, Mississippi State Geol. Survey, 1943, p. 56, pl. 6, figs. 1, 2.—CUSHMAN and TODD, Contr. Cushman Lab. Foram. Res., vol. 22, 1946, p. 63, pl. 11, figs. 11, 15.

Test semi-elliptical in outline, trochoid, one side nearly straight, the other strongly curved, periphery broadly rounded; chambers distinct, slightly inflated, three in a whorl in the adult, increasing very rapidly in size as added; sutures distinct, slightly depressed; wall smooth; aperture an elongate opening on the ventral side at the base of the last-formed chamber with a distinct, overhanging lip. Length 0.35-0.45 mm.; breadth 0.25-0.30 mm.; thickness 0.22-0.27 mm.

Holotype (Cushman Coll. No. 56885) from the Paleocene, 4.6 miles north of Fentress, Caldwell Co., Tex.

This species differs from *A. trigona* Reuss in the much broader form and the wide aperture.

314. NEW NAMES FOR FOUR HOMONYM SPECIES  
DESCRIBED IN "FORAMINIFERA IN THE GULLMAR FJORD  
AND THE SKAGERAK."

BY HANS HÖGLUND

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Dr. Hans E. Thalmann has kindly called my attention to the occurrence of four homonyms among the species erected by me in "Foraminifera in the Gullmar Fjord and the Skagerak," published in *Zoologiska Bidrag från Uppsala*, Bd. 26, 1947. I therefore propose the following new names:

*Thurammina* (?) *faerleensis* Höglund, new name for *Thurammina* (?) *sphaerica* Höglund, op. cit., p. 54, pl. 4, figs. 22-26, preoccupied by Ireland, *Journ. Pal.*, vol. 13, 1939, p. 197, text figs. A-33 and A-34.

*Ammodiscus gullmarensis* Höglund, new name for *Ammodiscus planus* Höglund, op. cit., p. 123, pl. 8, figs. 2, 3, 8; pl. 28, figs. 17, 18; text figs. 85-89, 105, 106, 109, preoccupied by Loeblich, *Journ. Pal.*, vol. 20, 1946, p. 133, pl. 22, fig. 2.

*Textularia kattagatensis* Höglund new name for *Textularia gracilima* Höglund, op. cit., p. 180, pl. 13, fig. 2; text fig. 156, preoccupied by Andreae, Abhandl. Geol. Special-Karte Elsass-Lothringen, vol. 2, pt. 3, 1884, p. 143, pl. 8, fig. 9.

*Trochammina quadriloba* Höglund, new name for *Trochammina pusilla* Höglund, op. cit., p. 201, pl. 17, figs. 4a-c; text figs. 183, 184, preoccupied by *Trochammina* (*Serpula*) *pusilla* (Geinitz, 1848) according to Jones, Parker and Kirkby, Ann. Mag. Nat. Hist., 4th ser., vol. 4, 1869, p. 389, pl. 13, figs. 2-6, 15.

In the preceding issue of these Contributions, a paper "The Foraminifera from the Red Bluff-Yazoo Section at Red Bluff, Mississippi" described certain new species and listed numerous others from a locality on the Chickasawhay River in Mississippi. W. H. Monroe, who collected the material studied in this paper, has pointed out (personal communication) that the locality was Hiwannee and not Red Bluff as stated. Therefore, in the locality data for the new species, the word *Hiwannee* should be substituted for the words *Red Bluff* so that the localities should read either upper Eocene, Yazoo clay of the Jackson group, Hiwannee, Chickasawhay River, Miss., or lower Oligocene, Red Bluff clay, Hiwannee, Chickasawhay River, Miss.

It may also be mentioned that the specific name *gracilis* for the new *Amphimorphina* is the proper one, as it appears on p. 3, and not *fragilis* as appears erroneously in the lists and on the explanation of pl. 2.

## RECENT LITERATURE ON THE FORAMINIFERA

Below are given some of the more recent works on the foraminifera that have come to hand:

Silvestri, A. Foraminiferi dell'Eocene della Somalia, Pt. III, Fasc. 1.—Pal. Ital., Mem. Paleont., vol. 32, suppl. 5, 1942, pp. 1-94 (181-274), pls. 1-9 (23-31), 1 text fig.—Thirty-seven species and varieties are described and figured, four new. Most of the species are *Nummulites* and complete synonymies are given.

Sulla Formazione Miocenica dei Dintorni di Homs (Tripolitania).—Boll. Soc. Geol. Ital., vol. 65, 1946, pp. 1-8, text figs. 1, 2. A few foraminifera are mentioned and sections figured.

Cazzani, Gaetano. Tentativo di Suddivisione Stratigrafica dell'Elveziano Bolognese (Nota preliminare).—Ann. Mus. Geol. Bologna, ser. 2, vol. 17, 1943-44 (1944), pp. 23-32.—Numerous foraminifera mentioned.

Brönnimann, Paul. Zur Morphologie von *Aktinocyclus* Gümbel 1868.—Eclogae geologicae Helvetiae, vol. 38, No. 2, 1945, pp. 560-578, pl. 20, text figs. 1-14.

Zur Frage der verwandtschaftlichen Beziehungen zwischen *Discocyclina* s. s. und *Asterocyclina*.—L. c., pp. 579-615, pls. 21, 22, text figs. 1-23.

Zur Neu-Definition von *Pliolepidina* H. Douvillé 1915.—L. c., vol. 39, No. 2, 1946, pp. 373-379.

**Selli, Raimondo.** La Stratigrafia di un Pozzo Profondo Perforato presso Pontelagoscuro (Ferrara).—Ann. Mus. Geol. Bologna, ser. 2, vol. 18, 1945-46 (1946), pp. 53-72.  
—Many species of foraminifera recorded.

La Struttura della *Glandulina glans* d'Orbigny e la Posizione Sistemática del Genere.  
—Riv. Ital. Pal., vol. 53, 1947, pp. 1-20, pl. 3.—The structure of this species is described and figured and a new species, *G. silvestrii*, also described and figured.

Sopra alcune *Dimorphina*.—Atti Soc. Ital. Sci. Nat., vol. 86, 1947, pp. 127-134, text figs. 1-10.—The structure of *D. tuberosa* d'Orbigny and *D. pedum* (d'Orbigny) is described and figured.

La struttura del gen. *Angulogerina* Cushman 1927.—L. c., vol. 87, 1948, pp. 40-48, text figs. 1-7.—The internal structures of *A. angulosa* (Williamson) and a new species, *A. foraninii*, are described and figured.

**Le Calvez, Jean.** *Entosolenia marginata*, Foraminifère apogamique ectoparasite d'un autre Foraminifère *Discorbis vilardeboanus*.—Comptes rendus séances Acad. Sci., vol. 224, 1947, pp. 1448-1450 (1, 2).

Les perforations du test de *Discorbis erecta* (Foraminifère).—Bull. Lab. Mar. Dinard, vol. 29, Sept. 1947, pp. 1-4, text fig. 1.

**ten Dam, A.** De Verspreiding van Boven-Rhaet in Nederland.—Geol. en Mijnbouw, 9<sup>e</sup> Jaarg., No. 11, Nov. 1947, pp. 220-222, map.—Mentions one species of foraminifera, *Ammodiscus parvulus* ten Dam.

**Plummer, Helen Jeanne.** Morphology of *Globivalvulina*.—Amer. Midland Nat., vol. 39, No. 1, Jan. 1948, pp. 169-173, text figs. 1-5.—Results are given of a study of many specimens with apparently a calcareous rather than arenaceous test.

**Bannink, D. D.** Een Monografie van het Genus *Operculina* d'Orbigny, 1826.—Doctor's Thesis, Leiden, Holland, Jan. 28, 1948, pp. 1-159, pls. 1-13, text figs. 1-15, numerous tables.—An exhaustive study of the genus *Operculina*, its species, and structure.

**Cushman, Joseph A., and Irene McCulloch.** The Species of *Bulimina* and Related Genera in the Collections of the Allan Hancock Foundation (Subfamily Uvigerininae by Ruth Todd).—Allan Hancock Pacific Expeditions, vol. 6, No. 5, 1948, pp. 231-294, pls. 29-36.—There are 59 species and varieties described and figured, 16 new.

**Stainforth, R. M.** Applied Micropaleontology in Coastal Ecuador.—Journ. Pal., vol. 22, No. 2, March 1948, pp. 113-151, pls. 24-26, text figs. 1, 2 (map, chart).—The foraminiferal faunas of the Tertiary from lower middle Eocene to uppermost Miocene are discussed, a range chart of the species given, and many species figured.

**Rau, Weldon W.** Foraminifera from the Porter Shale (Lincoln formation), Grays Harbor County, Washington.—L. c., pp. 152-174, pls. 27-31, 1 text fig.—Fifty-one species and varieties are recorded and figured, nine new.



- ten Dam, A. Foraminifera from the Middle Neocomian of the Netherlands.—L. c., pp. 175-192, pl. 32, text figs. 1-3, table 1.—There are 79 species recorded, 2 of which are new, and one new name.
- Thalmann, Hans E. Bibliography and Index to New Genera, Species, and Varieties of Foraminifera for the Year 1946.—L. c., pp. 193-221.
- Grice, Charles R. *Manorella*, A New Genus of Foraminifera from the Austin Chalk of Texas.—L. c., pp. 222-224, text figs. 1-5.—A new genus and species, *Manorella proteus*, of the family Placopsilinidae, described and figured.
- Parker, Frances L. Foraminifera of the Continental Shelf from the Gulf of Maine to Maryland.—Bull. Mus. Comp. Zoöl., vol. 100, No. 2, April 1948, pp. 213-241, pls. 1-7, text figs. 1-4, tables 1-10.—The foraminifera were studied in a quantitative manner to give data for distribution and ecologic factors. Many of the species are figured.
- Cushman, Joseph A. Arctic Foraminifera.—Special Publ. No. 23, Cushman Lab. Foram. Res., April 29, 1948, pp. 1-79, pls. 1-8.—The species from the Arctic regions are recorded, many described and figured, one new. The material studied is chiefly that collected by Capt. Robert A. Bartlett from northeastern Greenland.
- Brotzen, F. The Swedish Paleocene and its Foraminiferal Fauna.—Sver. Geol. Undersökning, ser. C, No. 493, 1948, pp. 1-140, pls. 1-19, text figs. 1-41, table 1.—The fauna of this area is described and figured with many new species and the following new genera: *Ataxophragmoides* (genotype *A. frankei* n. sp.), *Höglundina* (genotype *Rotalia elegans* d'Orbigny), *Pninaella* (genotype *P. scanica* n. sp.), *Pulsiphonina* n. subgen. (genotype *Siphonina prima* Plummer), *Reinholdella* (genotype *Asterigerina dreheri* (Bartenstein)).

J. A. C.







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